

WHAT IS CLAIMED IS:

1 1. A method for coding at least one characteristic of at least one pulse within a
2 pulse train, comprising the steps of:

3 (a) specifying at least one pulse characteristic relative to at least one
4 non-fixed reference; and

5 (b) applying a delta code for specifying said at least one pulse
6 characteristic relative to said at least one non-fixed reference.

1 2. The coding method of claim 1 further including the steps of:

2 (c) allocating allowable and non-allowable characteristic regions
3 relative to said at least one non-fixed reference

4 (d) applying the code relative to said allowable and non-allowable
5 characteristic regions.

1 3. The method of claim 2, wherein said allowable and non-allowable
2 characteristic regions are relative to at least one definable characteristic value within a
3 layout.

1 4. The method of claim 3, wherein said at least one definable characteristic
2 value is relative to at least one reference.

1 5. The method of claim 1, wherein said at least one reference is a
2 characteristic value of a given pulse.

1 6. The method of claim 5, wherein said given pulse is a preceding pulse.

1 7. The method of claim 5, wherein said given pulse is a succeeding pulse.

1 8. The method of claim 1, wherein a pulse characteristic is a temporal
2 characteristic or a non-temporal characteristic.

1 9. The method of claim 8, wherein the non-temporal pulse characteristic
2 includes at least one of a pulse width characteristic, a pulse polarity characteristic, a pulse
3 amplitude characteristic and a pulse type characteristic.

- 1 10. The method of claim 8, wherein the temporal pulse characteristic
2 corresponds to a pulse position in time.
- 1 11. The method of claim 1, wherein the delta code is a pseudorandom delta
2 code.
- 1 12. The method of claim 11, wherein the pseudorandom delta code is a Poisson
2 code.
- 1 13. The method of claim 11, wherein the pseudorandom delta code is a
2 constrained Poisson code (or, as a special case, a uniform delta code).
- 1 14. The method of claim 1, wherein the delta code is a deterministic delta code.
- 1 15. The method of claim 14, wherein the deterministic delta code is generated
2 using the sequential delta code generation methodology.
- 1 16. The method of claim 15, wherein the deterministic delta code is generated
2 using the Rational Congruential Sequential Delta Code generation methodology.
- 1 17. The method of claim 16, wherein the rational function employed in the
2 Rational Congruential Sequential Delta Code generation methodology is of the form
3 $f(x; a) = ax^n \bmod M$, where n is a nonzero integer.
- 1 18. The method of claim 16, wherein the rational function employed in the
2 Rational Congruential Sequential Delta Code generation methodology is of the form
3 $f(x; a) = ax^{-1} \bmod M$.
- 1 19. The method of claim 16, wherein the rational function employed in the
2 Rational Congruential Sequential Delta Code generation methodology is of the form
3 $f(x; a) = ax \bmod M$.
- 1 20. The method of claim 16, wherein the rational function employed in the
2 Rational Congruential Sequential Delta Code generation methodology is of the form
3 $f(x; a) = ax^2 \bmod M$.
- 1 21. The method of claim 16, wherein the rational function employed in the

2 Rational Congruential Sequential Delta Code generation methodology is of the form

3 $f(x; a) = ax^3 \bmod M$.

1 22. The method of claim 14, wherein the deterministic delta code is generated
2 using the iterative delta code generation methodology.

1 23. The method of claim 22, wherein the deterministic delta code is generated
2 using the Rational Congruential Iterative Delta Code generation methodology.

1 24. The method of claim 23, wherein the rational function employed in the
2 Rational Congruential Iterative Delta Code generation methodology is of the form
3 $f(x; a) = ax^n \bmod M$, where n is a nonzero integer.

1 25. The method of claim 23, wherein the rational function employed in the
2 Rational Congruential Iterative Delta Code generation methodology is of the form
3 $f(x; a) = ax^{-1} \bmod M$.

1 26. The method of claim 23, wherein the rational function employed in the
2 Rational Congruential Iterative Delta Code generation methodology is of the form
3 $f(x; a) = ax \bmod M$.

1 27. The method of claim 23, wherein the rational function employed in the
2 Rational Congruential Iterative Delta Code generation methodology is of the form
3 $f(x; a) = ax^2 \bmod M$.

1 28. The method of claim 23, wherein the rational function employed in the
2 Rational Congruential Iterative Delta Code generation methodology is of the form
3 $f(x; a) = ax^3 \bmod M$.

1 29. The method of claim 22, wherein the deterministic delta code is generated
2 using the Piecewise Linear Iterative Delta Code generation methodology.

1 30. An impulse transmission system comprising:
2 a Time Modulated Ultra Wideband Transmitter;

3 a Time Modulated Ultra Wideband Receiver; and
4 said Time Modulated Ultra Wideband Transmitter and said Time Modulated Ultra
5 Wideband Receiver employ a delta code, wherein said delta code specifies at least one
6 pulse characteristic relative to at least one non-fixed reference.

1 31. The impulse transmission system of claim 30, wherein allowable and non-
2 allowable characteristic regions are allocated relative to said at least one non-fixed
3 reference and said delta code is applied relative to said allowable and non-allowable
4 characteristic regions.

1 32. The impulse transmission system of claim 31, wherein said allowable and
2 non-allowable characteristic regions are relative to at least one definable characteristic
3 value within a layout.

1 33. The impulse transmission system of claim 32, wherein said at least one
2 definable characteristic value is relative to at least one reference.

1 34. The impulse transmission system of claim 30, wherein said at least one
2 reference is a characteristic value of a given pulse.

1 35. The impulse transmission system of claim 34, wherein said given pulse is a
2 preceding pulse.

1 36. The impulse transmission system of claim 34, wherein said given pulse is a
2 succeeding pulse.

1 37. The impulse transmission system of claim 30, wherein a pulse characteristic
2 is a temporal characteristic or a non-temporal characteristic.

1 38. The impulse transmission system of claim 37, wherein the non-temporal
2 pulse characteristic includes at least one of a pulse width characteristic, a pulse polarity
3 characteristic, a pulse amplitude characteristic and a pulse type characteristic.

1 39. The impulse transmission system of claim 37, wherein the temporal pulse
2 characteristic corresponds to a pulse position in time.

- 1 40. The impulse transmission system of claim 30, wherein the delta code is a
2 pseudorandom delta code.
- 1 41. The impulse transmission system of claim 40, wherein the pseudorandom
2 delta code is a Poisson code.
- 1 42. The impulse transmission system of claim 40, wherein the pseudorandom
2 delta code is a constrained Poisson code (or, as a special case, a uniform delta code).
- 1 43. The impulse transmission system of claim 30, wherein the delta code is a
2 deterministic delta code.
- 1 44. The impulse transmission system of claim 43, wherein the deterministic
2 delta code is generated using the sequential delta code generation methodology.
- 1 45. The impulse transmission system of claim 44, wherein the deterministic
2 delta code is generated using the Rational Congruential Sequential Delta Code generation
3 methodology.
- 1 46. The impulse transmission system of claim 45, wherein the rational function
2 employed in the Rational Congruential Sequential Delta Code generation methodology is
3 of the form $f(x; a) = ax^n \bmod M$, where n is a nonzero integer.
- 1 47. The impulse transmission system of claim 45, wherein the rational function
2 employed in the Rational Congruential Sequential Delta Code generation methodology is
3 of the form $f(x; a) = ax^{-1} \bmod M$.
- 1 48. The impulse transmission system of claim 45, wherein the rational function
2 employed in the Rational Congruential Sequential Delta Code generation methodology is
3 of the form $f(x; a) = ax \bmod M$.
- 1 49. The impulse transmission system of claim 45, wherein the rational function
2 employed in the Rational Congruential Sequential Delta Code generation methodology is
3 of the form $f(x; a) = ax^2 \bmod M$.
- 1 50. The impulse transmission system of claim 45, wherein the rational function
2 employed in the Rational Congruential Sequential Delta Code generation methodology is

3 of the form $f(x; a) = ax^3 \bmod M$.

1 51. The impulse transmission system of claim 43, wherein the deterministic
2 delta code is generated using the iterative delta code generation methodology.

1 52. The impulse transmission system of claim 51, wherein the deterministic
2 delta code is generated using the Rational Congruential Iterative Delta Code generation
3 methodology.

1 53. The impulse transmission system of claim 52, wherein the rational function
2 employed in the Rational Congruential Iterative Delta Code generation methodology is of
3 the form $f(x; a) = ax^n \bmod M$, where n is a nonzero integer.

1 54. The impulse transmission system of claim 52, wherein the rational function
2 employed in the Rational Congruential Iterative Delta Code generation methodology is of
3 the form $f(x; a) = ax^{-1} \bmod M$.

1 55. The impulse transmission system of claim 52, wherein the rational function
2 employed in the Rational Congruential Iterative Delta Code generation methodology is of
3 the form $f(x; a) = ax \bmod M$.

1 56. The impulse transmission system of claim 52, wherein the rational function
2 employed in the Rational Congruential Iterative Delta Code generation methodology is of
3 the form $f(x; a) = ax^2 \bmod M$.

1 57. The impulse transmission system of claim 52, wherein the rational function
2 employed in the Rational Congruential Iterative Delta Code generation methodology is of
3 the form $f(x; a) = ax^3 \bmod M$.

1 58. The impulse transmission system of claim 51, wherein the deterministic
2 delta code is generated using the Piecewise Linear Iterative Delta Code generation
3 methodology.